UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,174	12/06/2001	David Naccache	032326-166	9572

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INGBERG, TODD D

ART UNIT	PAPER NUMBER
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DATE MAILED: 06/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2006*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26,28-31 and 33-38* is/are pending in the application.

    4a) Of the above claim(s) *27,32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date *2/6/2001*.

4)☒ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. *5/29/06* .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claims 1 – 26 and 28-38 have been examined.

Claims 33-38 were added.

Claims 27 and 32 were previously cancelled.

Priority

1.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

Information Disclosure Statement

2.   The Information Disclosure Statement (IDS) filed December 6, 2001 has been

considered. The reference in French was considered to the extent that the Examiner does not

understand enough French to understand the meaning of the reference.

Oath/Declaration

3.   Applicant has elected to use an outdated version of 37 CFR 1.56 "(as amended effective

March 16, 1992)". Applicant should use the current form on the USPTO.GOV website when

submitting a new Declaration in future applications. No action required in this application.

Drawings

4.   New corrected drawings filed February 10, 2006 have been accepted.

Specification

5.   The new abstract submitted February 10, 2006 has been entered.

The objection to European spelling of words will be withdrawn. The inventors are citizens of

France and spell English words with the British spelling. If the Examiner has reason to be

concerned the search tools will not match the terms the Examiner will make a red pen

amendment at a later date.

6.   "FIBs", means Focus Ion Beam(s) as indicated by the Applicant.

The use of the trademark "JAVA" has been noted in this application. It should be capitalized

wherever it appears and be accompanied by the generic terminology.

7.   Although the use of trademarks is permissible in patent applications, the proprietary

nature of the marks should be respected and every effort made to prevent their use in any manner

which might adversely affect their validity as trademarks.

8.   The new title of the invention has been entered.

Claim Rejections - 35 USC § 112

9.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

10.   The prior rejection to Claims 8 – 10 will be withdrawn.

Claim Rejections - 35 USC § 101

11.   35 U.S.C. 101 reads as follows:
Whoever invents or discovers any new and useful process, machine, manufacture, or
composition of matter, or any new and useful improvement thereof, may obtain a patent
therefor, subject to the conditions and requirements of this title.

12.   Claims 1 – 26 and 28-38 are rejected under 35 U.S.C. 101 because the claimed invention

is directed to non-statutory subject matter. The current focus of the Patent Office in regard to

statutory inventions under 35 U.S.C. § 101 for method claims and claims that recite a judicial

exception (software) is that the claimed invention recite a practical application. Practical

application can be provided by a physical transformation or a useful, concrete and tangible result.

No physical transformation is recited and additionally, the final result of the claim is a validated

command which is not a tangible result because the validated command is not explicitly claimed

to be stored on a tangible medium. The following link on the World Wide Web is for the United

States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101.

<http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf>

Allowable Subject Matter

13.   Applicant's claims 1 – 26 and 28-38 are presented below. Applicant's arguments in

response to Office Action are persuasive. The new prior art of record does not overcome the

deficiencies stated in Applicant's response. The claims are presented below.

Claim 1
A method for monitoring progress with the execution of a linear sequence of instructions in a
computer program, comprising the steps of analysing the sequence of instructions transmitted to
a processor intended to execute the program being monitored by extracting a data item from each
instruction transmitted to the processor and performing a calculation on said data item, and
verifying, the result of this analysis by comparing the result of said calculation to reference data,
recorded with said program, wherein the reference data comprises a value pre-established so as
to correspond to the result of the analysis produced during the monitoring method only if all the
instructions in the sequence of instructions have actually been analysed during the running of the
program.

Claim 2
A method according to Claim 1, wherein the verification of the result of the analysis is caused by
an instruction placed at a predetermined location in the program to be monitored , said
instruction containing the reference data relating to a set of instructions whose correct execution
is to be monitored

Claim 3
A method according to Claim 1 wherein, when the instructions of the set of instructions to be
monitored are in the form of a value, said analysis of the instructions is carried out by using these
instructions as a numerical value.

Claim 4
A method according to Claim 1, comprising the steps of:
- during the preparation of the program to be monitored :
    -    incorporating, in at least one predetermined location in a sequence of instructions
    in the program, a reference value established according to a predetermined rule applied to
    identifiable data in each instruction to be monitored , and during the execution of the
    program to be monitored:

- obtaining said identifiable data in each instruction received for execution
- applying said predetermined rule to said identifiable data thus obtained in order to establish a
verification value, and
- verifying that this verification value actually corresponds to the reference value recorded
with the program.

Claim 5
A method according to Claim 1, further comprising a step of interrupting the flow of the program
if the analysis reveals that the program being monitored has not been run as expected.

Claim 6
A method according to Claim 1, further comprising an invalidation step for future use of the
device comprising the monitored program if said analysis reveals a predetermined number of
times that the program being monitored has not run in the expected manner.

Claim 7
A method according to Claim 1 wherein the set of instructions to be monitored does not include
jumps in its expected flow.

Claim 8
A method according to Claim 1 wherein, when the program to be monitored provides for at least
one jump, the monitoring method is applied separately to sets of instructions in the program
which do not include jumps between two successive instructions.

Claim 9
A method according to Claim 8, wherein, when the program to be monitored includes an
instruction for a jump dependent on the manipulated data, the monitoring method is implemented
separately for a set of instructions which precedes the jump, and for at least one set of
instructions which follows said jump.

Claim 10
A method according to Claim 9, wherein, for a set of instructions providing for a jump, an
instruction which controls this jump is integrated in said set of instructions for the purpose of
obtaining a verification value for thus set of instructions before executing the jump instruction.

Claim 11
A method according to Claim 1 wherein the analysis is reinitialised before each new monitoring
of a sequence of instructions to be monitored.

Claim 12
A method according to Claim 11, wherein the reinitialisation of the analysis of each new
monitoring includes the step of erasing or replacing a verification value obtained during a
previous analysis.

Claim 13
A method according to Claim 11 wherein the reinitialisation of the monitoring analysis is controlled by the software itself.

Claim 14
A method according to Claim 1 wherein the analysis produces a verification value obtained as the last value in a series of values which is made to change successively with the analysis of each of the analysed instructions of the set of instructions, thus making it possible to contain an internal state of the running of the monitoring method and to follow its changes.

Claim 15
A method according to Claim 1 wherein the analysis includes the step of calculating, for each instruction under consideration following a previous instruction, the result of an operation on both a value obtained of the instruction in question and the result obtained by the same operation performed on the previous instruction.

Claim 16
A method according to Claim 1 wherein the analysis includes the step of recursively applying a hash function to values obtained of each monitored instruction, starting from a last initialisation performed.

Claim 17
A method according to Claim 1 wherein the analysis includes the step of making a verification value change by performing a redundancy calculation on all the operating codes and the addresses executed since the last initialisation was carried out.

Claim 18
A method according to Claim 1 wherein the analysis includes the step of obtaining a comparison value by calculating successive intermediate values as the data of the respective instructions are obtained.

Claim 19
A method according to Claim 1 wherein the analysis comprises a step of saving each data item necessary for verification, obtained from instructions in the set of instructions to be monitored as they are executed, and performing a calculation of a verification value from these data only at the necessary time, once all the necessary data have been obtained.

Claim 20
A device for monitoring progress with the execution of a series of instructions of a computer program, comprising means for analysing the sequence of instructions transmitted to the processor intended to execute the program being monitored by extracting a data item from each instruction transmitted to the processor and performing a calculation on said data item, and means for verifying the result of this analysis by comparing the result of said calculation to reference data recorded with said program, wherein the reference data comprises a value pre-

established so as to correspond to the result of the analysis produced during monitoring only if all the instructions in the sequence of instructions have actually been analysed during the running of the program.

Claim 21

A device according to Claim 20, further including a register for recording intermediate results in a calculation in a chain carried out by the analysis means in order to obtain a verification value.

Claim 22

A device according to Claim 21, further comprising means for recording a predetermined value or resetting the register under the control of an instruction transmitted during the execution of a program to be monitored.

Claim 23

A device according to Claim 20, further comprising means for counting the number of unexpected events in the program being monitored, as determined by the analysis means, and means for invalidating the future use of the program to be monitored if this number reaches a predetermined threshold.

Claim 24

A device according to Claim 20 that is integrated into a programmed device containing said program to be monitored.

Claim 25

A device according to Claim 20 that is integrated into a program execution device.

Claim 26

A program execution device that executes a series of instructions of a computer program, comprising means for analysing the sequence of instructions transmitted for execution by extracting a data item from each instruction and performing a calculation on said data item, and means for verifying the result of this analysis by comparing the result of said calculation to reference data recorded with the program to be monitored, wherein the reference data comprises a value pre-established so as to correspond to the result of the analysis produced during monitoring only if all the instructions in the sequence of instructions have actually been analysed during the running of the program.

Claim 28

A programmed device containing a series of recorded instructions and a fixed memory containing reference data pre-established as a function of data contained in said instructions for analysis and verification of the sequence of instructions, wherein the reference data comprises a value pre-established so as to correspond to the result of the analysis produced during monitoring only if all the instructions in the sequence of instructions have actually been analyzed during the running of the program.

Claim 29
A device according to Claim 28, wherein said device is a smart card.

Claim 30
A device according to Claim 28 wherein the reference data are recorded in the form of a prewired value or <u>values fixed in memory</u>.

Claim 31
A device for programming a programmed device according to Claim 28, comprising means for entering, in at least one predetermined location in a sequence of instructions in the program, a reference value calculated according to a preestablished mode from data included in each instruction in a set of instructions whose execution is to be monitored.

Claim 33
A method for verifying proper execution of a sequence of instructions in a program by a processor, comprising the following steps:
(i) retrieving an instruction in said sequence from an instruction register, for execution by the processor;
(ii) calculating an updated monitoring value by processing data contained in the retrieved instruction with a stored monitoring value, and replacing the stored monitoring value with the updated monitoring value;
(iii) loading the retrieved instruction into the processor for execution;
(iv) repeating steps (i) - (iii) for each instruction in the sequence;
(v) retrieving a monitoring instruction at the end of the said sequence of instructions that contains a reference value;
(vi) comparing said reference value to the stored monitoring value; and
(viii) confirming whether the proper set of instructions in said sequence have been executed, on the basis of said comparison.

Claim 34
The method of claim 33, wherein the data contained in the retrieved instruction comprises the numerical value of binary code for the instruction.

Claim 35
The method of claim 34, wherein the processing of said data comprises a hashing operation performed on said numerical value with the stored monitoring value.

Claim 36
The method of claim 33 further including the step of retrieving an initial monitoring instruction at the beginning of said sequence that contains an initial monitoring value, and storing said initial monitoring value as the stored monitoring value.

Claim 37

The method of claim 33, further including the step of interrupting the execution of said program if said comparison indicates that the proper set of instructions has not been executed.

Claim 38
The method of claim 33 wherein, if said program contains a jump instruction, steps (v) - (vii) are executed prior to said jump instruction.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Todd Ingberg whose telephone number is (571) 272-3723. The examiner

can normally be reached on during the work week..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kakali Chaki can be reached on (571) 272-3719. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

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applications is available through Private PAIR only. For more information about the PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).
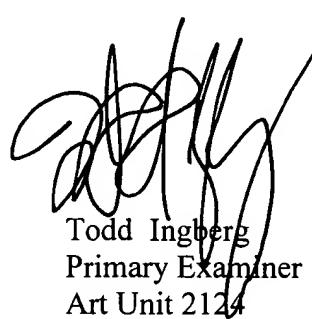
Todd Ingberg
Primary Examiner
Art Unit 2124

TI